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Recent Advances and Future Direction in Lyophilisation and Desiccation of Mesenchymal Stem Cells

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Abstract

© 2016 Akalabya Bissoyi et al.Mesenchymal Stem Cells (MSCs) are a promising mammalian cell type as they can be used for the reconstruction of human tissues and organs. MSCs are shown to form bone, cartilage, fat, and muscle-like cells under specific cultivation conditions. Current technology of MSCs cryopreservation has significant disadvantages. Alternative technologies of mammalian cells preservation through lyophilisation or desiccation (air-drying) are among the upcoming domains of investigation in the field of cryobiology. Different protectants and their combinations were studied in this context. Loading of the protectant in the live cell can be a challenging issue but recent studies have shown encouraging results. This paper deals with a review of the protectants, methods of their delivery, and physical boundary conditions adopted for the desiccation and lyophilisation of mammalian cells, including MSCs. A hybrid technique combining both methods is also proposed as a promising way of MSCs dry preservation.

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